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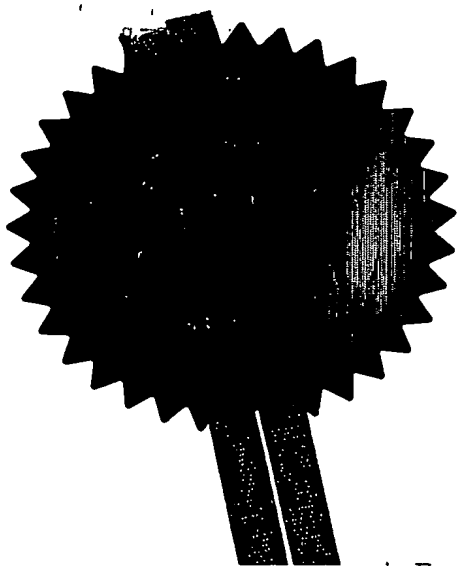

Signed P. Mahoney

Dated 1 August 2003

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25JUN03 E817491-1 D02716
P01/7700 0.00-0314693.3

Request for grant of a patent

1/77

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1.	Your reference	PAT 02301b GB
2.	Patent application number	0314693.3
		2 5 JUN 2003
3.	Full name, address and post code of the or of each applicant	Nokia Corporation Keilalahdentie 4 02150 Espoo Finland
	Patents ADP Number	76522170004
	If the applicant is a corporate body, give the country/state of its incorporation	Finland
4.	Title of the invention	Device for Directing the Opertion of a User's Personal Communication Device
5.	Name of your agent "Address for service" in the United Kingdom to which all correspondence should be sent	Nokia IPR Department Nokia House, Summit Avenue Farnborough, Hants GU14 ONG
	Patents ADP number	7577638001 ✓

6.	If you are declaring priority from one or more earlier patent applications, give the country and the date of filing of the or of each of these earlier applications and the or each application number	Country	Priority Application Number	Date of Filing
		GB	0214714.8	26 June 2002

7.	If this application is divided or otherwise derived from an earlier UK application, give the number and the filing date of the earlier application	Number of earlier application	Date of Filing

8. Is a statement of inventorship and of right to grant of a patent required in support of this request? (Answer 'Yes' if:

a) any applicant named in part 3 is not an inventor, or
b) there is an inventor who is not named as an applicant, or
c) any named applicant is a corporate body.

Yes

Patents Form 1/77

9. Enter the number of sheets for any of the following items you are filing with this form. Do not count copies of the same document

Continuation sheets of this form

Description	12
Claims(s)	2
Abstract	1
Drawing(s)	6 only RM

10. If you are also filing any of the following state how many against each item.

Priority documents

Translation of priority documents

Statement of inventorship and right to grant of a patent (Patents Form 7/77)

Request for preliminary examination and search (Patents Form 9/77)

Request for substantive examination (Patents Form 10/77)

Any other documents (please specify)

11. I/We request the grant of a patent on the basis of this application.

Signature Helen Haws Date 23/6/03

Helen Haws

12. Name and daytime telephone number of person to contact in the United Kingdom

Helen Haws – 01252 865262

PAT 02301b GB

Device for Directing the Operation of a User's Personal Communication Apparatus

The present invention relates to directing the operation of a user's personal communication apparatus.

Personal communication apparatus in the form of cellular telephones have become ubiquitous. As cellular telephones have evolved from just mobile analogues of traditional fixed-line telephones providing only voice communication into multi-faceted communication devices providing not only voice communication but a range of communication options including notably internet access, there is a need to prevent the complexity of using the cellular telephone's user interface escalating. The present invention is generally concerned with this problem.

According to one aspect, the present invention may provide a device for directing the operation of a user's personal communication apparatus, comprising an RF tag located in a decorative casing of a size to facilitate handling by the user, wherein the RF tag stores a code to direct the operation of a user's personal communication device.

Beyond the dimensional limitation, there is no limit on the appearance of the casing except to say that, in preferred embodiments, the casing comprises a gewgaw, ideally appealing to the fashion or aesthetic sensibilities of the user and which may serve as a fashion accessory, or emblem for a particular group.

According to another aspect, the present invention may provide a system comprising a device comprising an RF tag embedded in a casing, and a

user's personal communication apparatus having an RF tag reader which is operable upon reading the RF tag to perform an operation associated with said RF tag.

By virtue of the above features, when the user wants to perform a certain operation with the personal communication apparatus, he can by-pass the normal input technologies, typically a keypad, by manoeuvring the device such that the RF tag is read by the RF tag reader, and then the personal communication apparatus performs an operation associated with the RF tag. Thus, the present invention offers rapid access to regularly used functions or operations without the need to navigate a menu. Moreover, access to these regularly used functions is made intuitive by associating a physical object, i.e. the device, with an operation. Preferably, the casing comprises a gewgaw, ideally appealing to the fashion or aesthetic sensibilities of the user and serving as a fashion accessory, or emblem for a particular group. Preferably, the devices are sized to be easily handled by the user. For example, this means that they are of sufficient size to be held by the user's fingers. Also preferably, the devices are not so large that it becomes a noticeable hindrance for the user to carry a set of them.

Preferably, the user's personal communication device comprises a docking port into which the casing can be docked for reading the RF tag. In one embodiment, the RF tag can only be read when docked so as to avoid the possibility of an accidental request of an operation associated with the code on an RF tag. To this end, either the RF tag reader/ RF tag can be calibrated to provide for only very close range reading i.e. when docked, or the RF tag can be provided with a switch means which is activated only when the RF tag is properly docked.

With this in mind, according to another aspect, the present invention may provide a set of devices for directing the operation of users' personal communication apparatuses, each comprising an RF tag embedded in a

decorative casing, the appearance of each casing being distinguishable from others in the set.

In this way, the user can access a range of functions of the personal communication apparatus by selecting the appropriate device from the set and using that to activate the function.

According to another aspect, the present invention may provide a device for directing the operation of a user's personal communication apparatus comprising an RF tag embedded in a gewgaw.

Exemplary embodiments of the invention are herein described with reference to the accompanying drawings, in which:

Figures 1(a) and 1(b) show an iBead in accordance with the invention;

Figures 2(a) and 2(b) show a mobile phone equipped with an RF ID reader in accordance with the invention;

Figure 3 shows a system in accordance with the invention;

Figure 4 shows the structure of a message packet in accordance with the present invention;

Figures 5(a), 5(b) & 5(c) show the path of a Figure 4 message packet; and

Figures 6(a), 6(b) and Figure 7 to 13 show various ways an iBead can interact with an RF ID reader, each providing the user with a different interaction experience.

RF ID technology is based on bi-directional radio frequency communication between an RF ID control unit and an RF tag. The tag comprises an antenna, control circuitry and memory in which information is stored. The memory may be read-only in which case the information is unalterable, or read/write which means that information can be overwritten or added to memory at a later time by the user. The control unit comprises an antenna and dulation/demodulation circuits. When operating, the control unit emits an electromagnetic field which extends over a certain volume around the control unit. If an RF tag passes into this volume, the field activates the control circuitry of the RF tag. A dialog is then set up in which the tag identifies itself by sending the information contained in its memory to the control unit. Upon receiving the information, the control unit decodes it. RF tags can be either passive or active. In the case of a passive RF tag, there is no on-board power supply, rather, energy is obtained from the electromagnetic field generated by the RF ID controller. Active tags contain an intrinsic power source, such as a battery.

RF ID technology has become technically mature and is being adopted in different fields ranging from, for example, storage management to electronics tickets in commuting. At present, RF tags are available at about the size of a sand grain and at low cost.

Referring to Figures 1(a) and Figure 1(b), an iBead 10 comprising an RF tag 20 embedded in a decorative casing 40. Referring to Figure 1(b), the RF tag 20 comprises an antenna 22, control circuitry 24, and read-only memory 26 in which a 128-bit code number is stored. The RF tag 20 is passive and so does not contain its own power source. The physical size of the chip bearing the RF tag is only 0.4 mm squared. The casing 40 is much larger and is made so deliberately to facilitate easy handling by the user, and to enable the casing to perform an aesthetic function. For the purposes of the accompanying drawing, the casing is shown diagrammatically without regard to aesthetic considerations. However, in a physical embodiment of the invention, the casing can serve as a fashion accessory and blend with or

augment the look of the user, or make a statement about the user. Also, the casing may represent a particular private group of people, the emblem of a sporting team, or the brand of a commercial venture. The casing can also be hard or soft, and provides protection to the RF tag 20.

A portable personal communication apparatus in the form of a mobile phone 50 conventionally comprises a display 52 and a keypad 54, as shown in Figure 2(a) , and a cellular radio interface 56 capable of data/speech reception and transmission to and from a cellular network 70, and a central control unit 58 for coordinating the overall operation of the mobile phone and a memory unit 59, as shown in Figure 2(b). In accordance with an embodiment of the invention, the mobile phone 50 further comprises an RF ID reader 60.

The cellular network includes a gateway server 75 through which internet access is achieved. An iBead broker server 80 and a plurality of iBead action servers 85a, 85b are also shown making up part of the internet. The gateway server 75 is connected to the broker server by an encrypted data pipeline 89, and the broker server 80 is connected to the action servers 85a, 85b by encrypted data pipelines 90a, 90b.

When the user brings the iBead 10 into the reading range of the RF ID reader 60, the RF ID reader 60 reads the code on the iBead 10 and communicates this to the central control unit 58. First, the central control unit 58 checks in its memory 59 to see whether the code of the iBead is known locally. If the code is known locally, the central control unit 58 performs the macro/operation allocated to the code.

One example of this type of macro is sending an email to a spouse to indicate that you will be home later than usual. The whole process of sending the email could be triggered by the iBead 10 with no further intervention being required from the user. Alternatively, the macro might stop short of actually

sending the email and provide the user with the opportunity to amend and/or approve the email before sending. Even in this case, navigating the menu structure, and the cumbersome process of entering an email on a mobile phone keypad is largely avoided. Another example is that a macro performs the operation of opening up the browser of the mobile phone at a predetermined IP address. If, for example, the iBead bore the logo of CNN, then the predetermined IP address might be that of the CNN home page.

If the code of the iBead 10 is not known locally, the phone 50 sends a action_request message over it's cellular interface 56 to a remote server. The server can either be a default server. Alternatively, the server which should be accessed can be indicated by a part of the code itself. The server can be part of the cellular network or a server on the Internet.

The action_request message 100 comprises at least a message identifier field 102 indicating that the message is an iBead packet, an action code field 104 containing the code of the RF tag in the iBead, and an authentication field 106 containing information such as the IMEI code of the mobile phone.

In the embodiment shown, the action_request message is based on the message identifier field 102 automatically directed to the iBead broker server 80. The broker server 80 contains a database which, inter alia, maps or associates the codes of the RF tags in the iBeads with predetermined actions.

If the broker server 80 recognizes the action code in the action_request message, then two possibilities arise. In the case where the instruction or operation associated with the code is relatively simple and/or relate to a standard system operation, then the instructions for the macro may be returned to the mobile phone 50 directly by the broker server and carried out as shown by the diagram in Figure 5(a). In the case where the instruction or operation associated with the code is more complicated or relates to a non-standard operation, the broker server 80 delegates responsibility to a relevant action server, let's say in this case action server 85a, which then sends the

instructions for the macro to the phone 50, either directly as shown by the diagram in Figure 5(b), or back via the broker server 80 as shown in Figure 5(c). The advantage of the Figure 5(c) embodiment is that it is possible to make use of the encrypted pipeline 90b.

An advantage of the remotely-stored macro approach illustrated by Figures 5(a) and 5(b) is that the perceived function of the iBead 10 can be centrally controlled and updated according to need by the sponsor of the iBead 10. Another important advantage of this approach is that the access to the server 80 by the mobile phone 50 alerts the servers to the use of the iBead, and to the identity of the iBead by the authentication field 106. The commercial advantage of this remotely-stored macro approach might be further illustrated by the following examples, where a retailer is used a specific example of an iBead sponsor.

As part of a product promotion, a retailer may produce a set of iBeads having a casing signifying the retailer, each iBead bearing the same code. The retailer registers the iBead's code and the action to be performed on the broker server 80. Thus, once a customer reads the iBead (and assuming the action is not known in the phone 50 itself) the action defined by the retailer can be performed in various ways, as described above. One possibility is that the iBead might provide access to the retailer's own web server which includes web pages dedicated to the product to be promoted. Because the server will record the number of hits on the web pages, the promotional material shown and/or terms of the offer for sale can be dynamically adjusted or customised in real time according to consumer interest. The retailer also has a real time overview of currently active iBeads.

Alternatively, the retailer may produce a set of iBeads having a casing signifying the retailer, but each iBead bearing a different code. Because the action_request message 100 includes the identity of the iBead user in the authentication field 106, a special association can be made between an individual iBead and its first user, who may be the purchaser. This knowledge

enables other possible uses. For example, since iBeads can be swapped and passed between users, the retailer can reward the first user with some credits, in effect a royalty payment, for putting a particular iBead into circulation amongst his circle of acquaintances. Also, for various applications, the operation performed for the first user can be different or accumulative for the second and subsequent users. The retailer can track the use patterns (type/frequency) of its iBeads via a real time interface accessing the relevant server 80, 85a, 85b, in the Internet. This right can also be given to a first user in respect of his iBead(s).

Where the instructions to be downloaded to the user are dynamic as in some other examples above, it is preferred that the downloading operation is coordinated from an action server, to which the retailer has rights to program, or at the retailer's own server – although, in principle, this might also be done at the broker server 80.

In other embodiments, when the macro or instructions have been first retrieved from a remote server 80, 85a or 85b, they can be cached locally to avoid repeating the download operation.

In the above described embodiments, the reading of an iBead 10 was triggered by moving it into the reading range of the RF tag reader 60. This process is illustrated in Figure 7. Referring to Figure 7, an iBead 10 comprising an RF tag 20 is embedded into a protective and/or decorative casing 40. An RF ID reader 60 is located close to the surface but beneath the surface of the phone cover 53. The interaction between iBead 10 and the RF ID reader 60 may be characterised as "skimming". The arrow 32 shows the motion of the iBead which moves it into the reading range of the RF ID reader 60 enabling a non-contact data transfer. For "skimming", the casing 40 need only pass in the general vicinity of the RF ID reader 60 in order for the RF tag to be read.

It will be appreciated that from a technical standpoint the RF tag technology does not require contact between an iBead 10 and an RF reader 60 in order to function. However, users are likely to carry a set of iBeads 10 which provide them with a quick and easy way to perform a range of tasks. However, in carrying a set of iBeads, which may be carried together on a single string or strap, there is the risk that more than one iBead will be read by the iBead reader which could lead to actions unintended by the user being performed. One way of indicating which iBead should be activated is to list the iBeads which have been read by the RF tag reader in a menu, and request the user to select the required iBead from the menu. Alternatively, as shown in Figures 6(a) and 6(b), the RF tag reader 60 is equipped with a docking mechanism 30 into which the iBead must be docked in order to be activated for reading. In Figure 6(a), the iBead 10 is not docked and not activated, and thus cannot be read. In Figure 6(a), the iBead is docked to the docking mechanism 30 and can be read. Thus, the use of docking mechanism serves to identify for sure the iBead to be read. Also, in the case where the iBead contains a read-only RF tag, which does include any encryption, whereby the fixed 128-bits can be read by any third party, the selective activation of the iBead is facilitated by docking.

There are various ways to activate the iBeads, for example, by mechanical activation. In one embodiment, a magnet in the RF ID reader 60 causes mechanical movement inside the iBead 10 which closes and open circuit pathway in the iBead, thereby activating the resonator of the iBead. Another example is resonator circuit activation, in which the iBead 10 is provided with a magnetic resonator which when remote from the reader does not resonate; but when it is brought close to the reader, a matched circuit in the reader causes the resonator inside the iBead to resonate.

From the user experience standpoint, some kind of tactile interaction is often desirable. Accordingly, in one embodiment, a spring/switch is built into the in

the RF ID reader and/or docking mechanism 5 and provides tactile feedback when interaction occurs.

Figures 8 to 10 show another example where tactile feedback is provided to the user. Referring to Figure 8, the iBead casing 40 includes a protruding docking member 34. It is inserted into the complementary jaws 31 of a docking mechanism 30 made of compressible, deformable material. Downward pressure, as indicated by the arrow P, on the iBead 10 exerted by the user causes the abutting face of the casing 40 to gently compress the body of the docking mechanism to enable the insertion of the docking member 24 into the jaws 31 to a distance at which ribs (not visible at the scale shown) formed in the jaws 31 snap into engagement with the grooves 36 formed in the docking member 24 and retain the iBead 10 in position. The positive retainment of the iBead is sensed by the user and thus serves to provide tactile feedback. (The grooves are most clearly visible in the enlarged portion of Figure 10). The RF ID reader 60 is calibrated such that it can only read the iBead 10 at a very limited range equivalent to when the iBead is held fast in the docking mechanism 30 as shown in Figure 9. It will be appreciated that this example docking mechanism not only provides the user with tactile feedback as just described, but also serves to control which iBead is read. The iBead can be removed by a concerted pull, the deformability of the docking mechanism enabling proper withdrawal.

In a variation of this embodiment, the calibration of the RF ID reader and the physical properties of the docking mechanism 30 can be adjusted such that once the iBead is held fast in the docking mechanism still further user-applied pressure is required to reduce the distance between the RF tag and the RF ID reader to reading range. Thus, the iBead can act very much like a button.

Another docking mechanism is shown in Figures 11 and 12. In this embodiment the casing 40 is first manoeuvred, as indicate by the arrow P in Figure 12, such that the docking member 34 enters the jaws of the docking

mechanism and then twisted, as indicated by the arrow T in Figure 12, to lock it into place. As per the previous embodiment, the calibration of the RF ID reader and the physical properties of the docking mechanism 30 can be adjusted such that once the iBead is twist locked into the docking mechanism still further user-applied pressure is required to reduce the distance between the RF tag and the RF ID reader to within reading range. Again, the iBead can act very much like a button.

To unlock and remove the iBead, it is twisted in the opposite direction to T and pulled.

The above embodiments are particularly suited to a situation in which a user buys an iBead and programs it to open a page of the news headlines and he does not like carrying beads on a strap. Since this is something he wants to do every day, he inserts the iBead into the RF ID reader.

Thus it will be appreciated that having a physical object (e.g. a iBead) representing a task or thing (e.g. "call Suzy" or "get latest news") can be easier for the user to understand, since there is a 1:1 relationship between the task, and the object used to complete the task. Also, tactile feedback is a natural extension of what humans already do, for example, when shaking hands or exchanging business cards.

In the Figure 13 embodiment, the iBead 10 is provided with an LED 42 which is coupled to a connection terminal 39 via power supply lines 41. The iBead can be mounted in the docking mechanism 30 as per any of the Figure 7 to 13 embodiments. The RF reader supplies power via a power line 38 to the mouth of the docking mechanism. When the iBead is docked, as previously described, a direct contact is made between the iBead 10 and the RF ID reader 60. Acting on instructions from the central processor 58 an electrical current is sent to the iBead via power supply lines. This can be used to power devices providing user feedback in the casing 40, such as the light emitting

diode 42 shown. Alternative devices include a small speaker for providing an audio signal, a bipolar display or a mechanical device for moving or rotating part of the casing 40.

This embodiment provides user feedback on a mobile electronics device. It is particularly suited for status related tasks where the user needs to be kept informed with the status of a task. Example of particular types of application for this type of iBead are given below.

Example 1: The user buys an "WLAN status bead" to check when they are in range of a WLAN hotspot, and docks it on their functional cover. The bead glows when it is in range (after getting the information from the handset).

Example 2: The user buys a "Wizard Bead" from their online gaming environment, which represents the health of their character in the online world. When the character is in danger, the wizard-shaped bead glows red, prompting the user to interact more with the online world.

Example 3: The user decides to back up the photos in the phone's inbox to their Club Nokia storage space. The status iBead flickers showing the data being sent, and glows green once the transfer is complete.

Thus, it will be appreciated that the described embodiments of the invention provide a solution which might replace some of the utilitarian things which people carry in their wallets with potentially items which can serve as fashion items but also have a function, this function being to simplify the, for example, mobile phones are used.

CLAIMS

1. A device for directing the operation of a user's personal communication apparatus, comprising an RF tag located in a decorative casing of a size to facilitate handling by the user, wherein the RF tag stores a code to direct the operation of a user's personal communication device.

2. A device as in Claim 1, and further including means for providing user feedback under selected conditions.

3. A device for directing the operation of a user's personal communication apparatus comprising an RF tag embedded in a gewgaw.

4. A device as in any of Claims 1 to 3, further comprising switch means by which the device can be switched between an inactive mode to an active mode in which it can be read.

5. A system comprising a device comprising an RF tag inside a casing, and a user's personal communication apparatus having an RF tag reader which is operable upon reading the RF tag to perform an operation associated with said RF tag.

6. A system as in Claim 5, wherein matching the RF tag with the said operation is performed locally in the user's personal communication apparatus.

7. A system as in Claim 5 or 6, further comprising a remote server containing a database mapping codes stored on RF tags with predetermined operations, wherein matching the RF tag with said associated operation is performed in a remote server.

8. A system as in Claim 7, further comprising means, on matching the code of the code of the RF tag of the device with a predetermined operation, to download to the user's personal communication apparatus instructions to perform said associated operation.

9. A system as in any of Claim 5 to 8, wherein the user's personal communication apparatus includes a docking mechanism into which the device can be docked.

10. A system as in Claim 9, wherein reading of the RF tag can take place only when the device is docked into the docking mechanism.

11. A system as in Claim 9, wherein reading of the RF tag can take place only when the device is docked into the docking mechanism and further pressure is applied to the casing by the user.

12. A system as in any of Claims 9 to 11, wherein the device further comprises means for providing user feedback under selected conditions, and the user's personal communication apparatus comprises a power supply means to supply power to said feedback means, when the device is docked.

13. A set of devices for directing the operation of users' personal apparatuses, each comprising an RF tag embedded in a decorative casing, the appearance of each casing being differentiatable from others in the set.

ABSTRACT

A system comprising a device comprising an RF tag embedded in a casing, and a mobile phone having an RF tag reader which is operable upon reading the RF tag to perform an operation associated with said RF tag. When the user wants to perform a certain operation with the phone, he can by-pass the normal input technologies, typically a keypad, by manoeuvring the device such that the RF tag is read by the RF tag reader, and then the personal communication apparatus performs an operation associated with the RF tag. Thus, the present invention offers rapid access to regularly used functions or operations without the need to navigate a menu. Moreover, access to these regularly used functions is made intuitive by associating a physical object, i.e. the device, with an operation.

Figure 1(a)

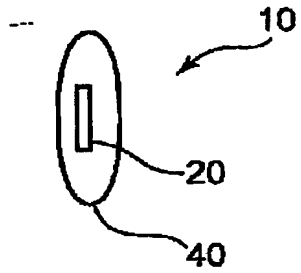

Figure 1(b)

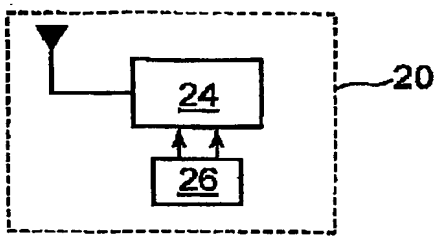

Figure 2(a)

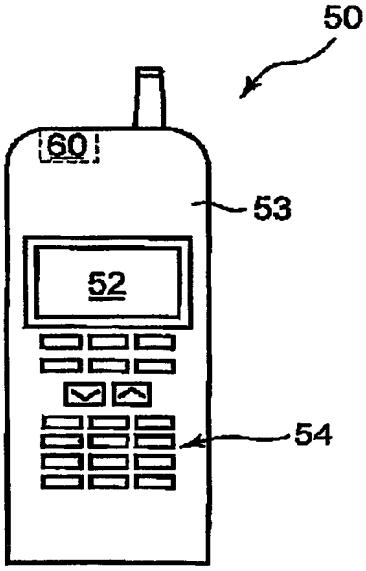

Figure 2(b)

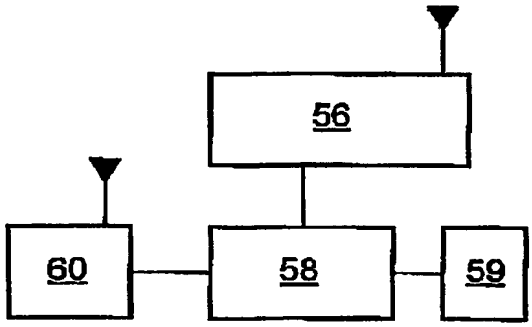

Figure 3

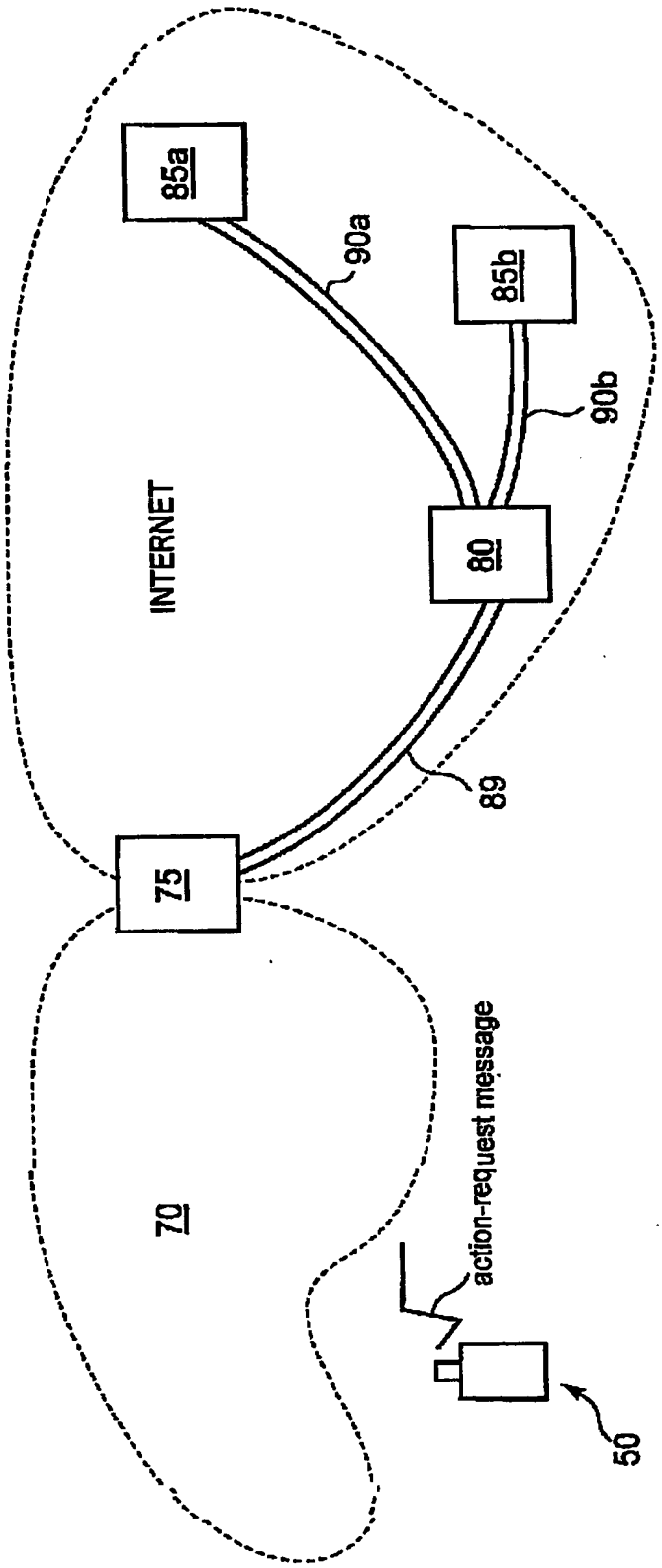

Figure 4

Figure 5(a)

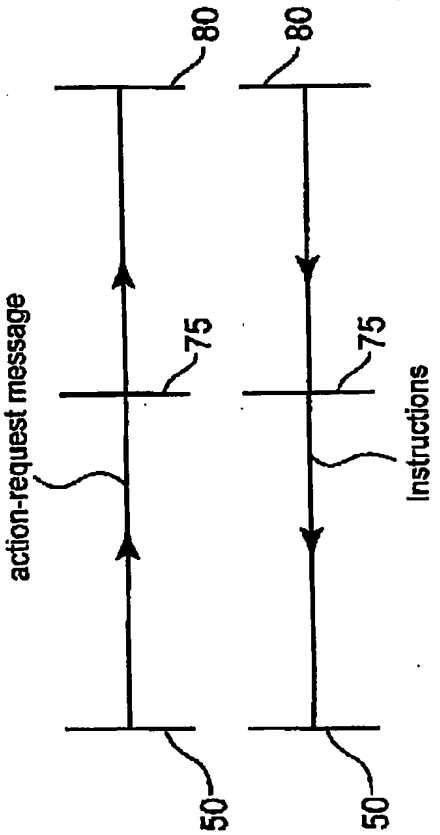

Figure 5(b)

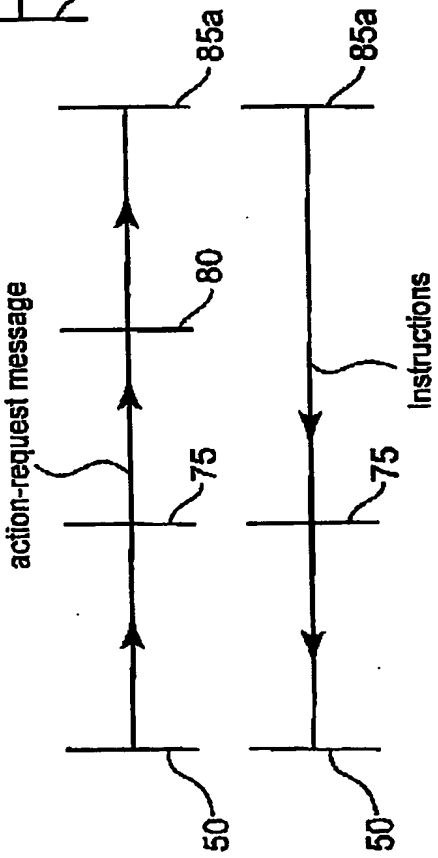

Figure 5(c)

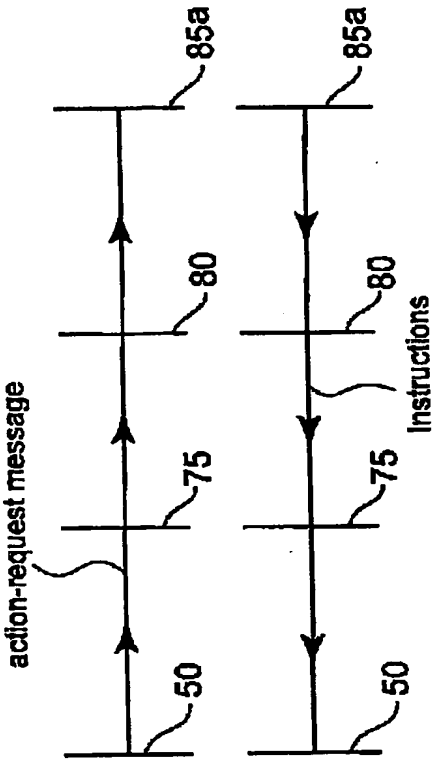

Figure 6(a)

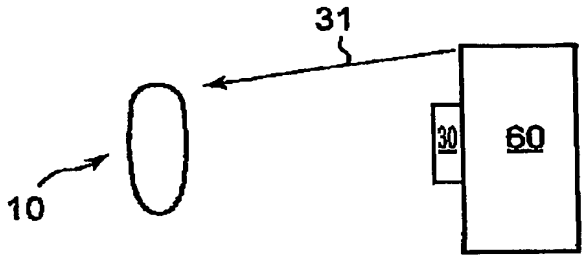

Figure 6(b)

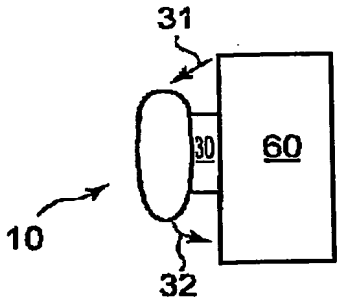

Figure 7

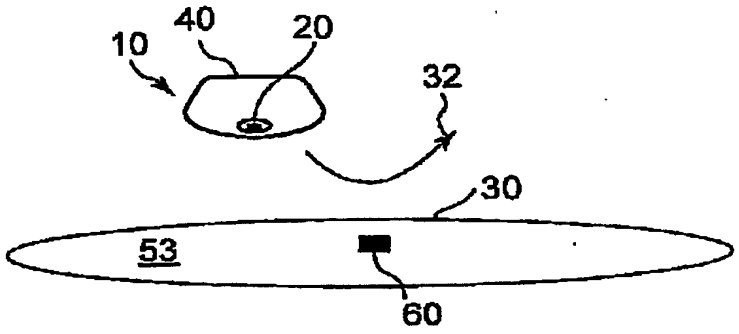

Figure 8

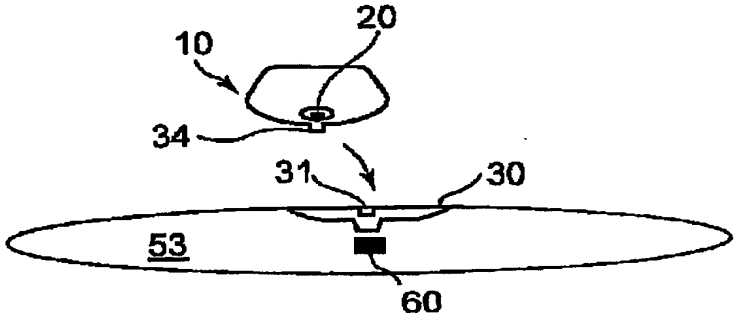

Figure 9

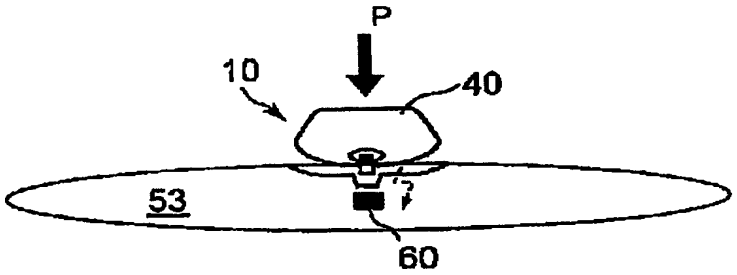

Figure 10

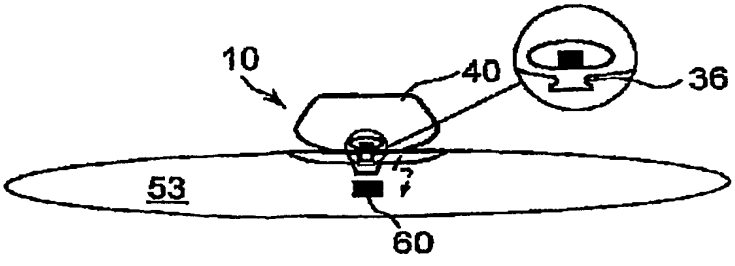

Figure 11

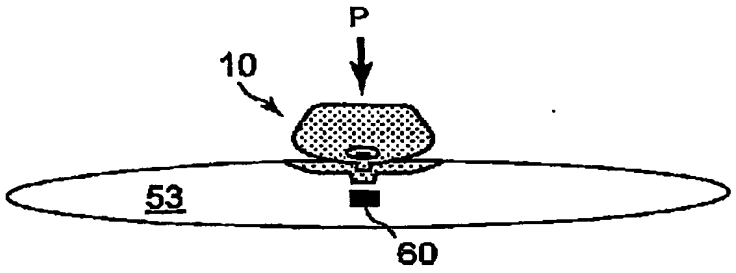

Figure 12

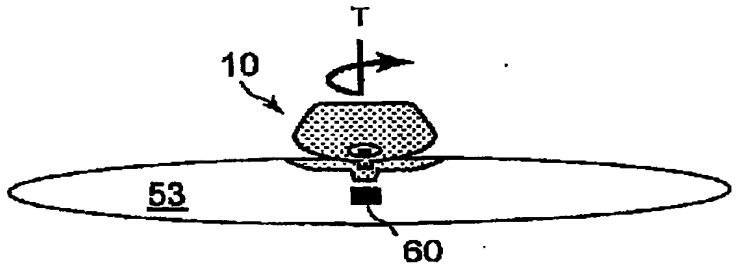

Figure 13